

**PATENT ABSTRACTS OF JAPAN**

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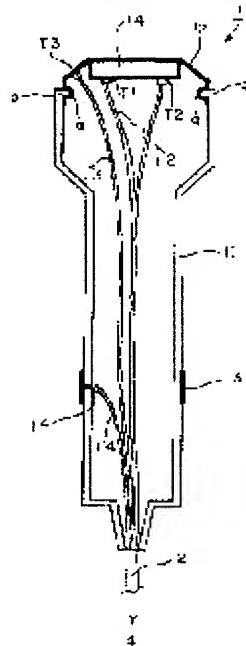
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**(54) ULTRASONIC COSMETIC PROBE**



**(57)Abstract:**

**PROBLEM TO BE SOLVED:** To further reinforce the skin cosmetic treatment effect of an ultrasonic cosmetic probe by using electric stimulation by a DC current, a high frequency AC current or a pulse current together in addition to physical stimulation by the ultrasonic vibration of the ultrasonic cosmetic probe.

**SOLUTION:** A vibration body 12 in a conical shape whose cross section is trapezoidal provided with a flat tip surface is attached to the tip of an insulating cylindrical case 11 and a grip electrode 13 is wound to a holding position at the center part of the case 11. An ultrasonic vibrator 14 constituted of piezoelectric ceramics is fixed to the inner side of the tip surface of the vibration body 12, lead wires L1 and L2 are respectively connected to the terminals T1 and T2 of the ultrasonic vibrator 14 and the lead wires L3 and L4 are respectively connected to the terminal T3

attached to the inner side of the vibration body 12 and the terminal T4 passed through the center part of the case 11 and conducted to the grip electrode 13. The lead wires L1, L2, L3 and L4 are converged into a cable 2 for connecting this ultrasonic cosmetic probe 1 and a control box and connected to a control circuit disposed inside the control box.

**[Detailed Description of the Invention]**

**[0001]**

**[Field of the Invention]**

This invention relates to the ultrasonic cosmetics probe which contacts the vibration body of an ultrasonic wave to skin surfaces, such as a face, and performs skin care.

[0002]

**[Problem(s) to be Solved by the Invention]**

If an ultrasonic wave generates an oscillatory wave with strong energy, and has an operation of crushing of a biomass, surface exfoliation, washing, generation of heat, etc. and this oscillatory wave is acted on the skin, A skin surface is sterilized, wastes, a horny layer, etc. are exfoliated, a pimple, the oil of pore, dirt, the remainder of makeup, etc. are removed and defecated, the circulation of a skin surface is urged, an organization is activated, and there is a beautiful skin effect which unfolds muscular stress and removes silverfish, wrinkles, sagging, etc. For this reason, the ultrasonic cosmetics probe of various kinds which contact the vibration body of an ultrasonic wave to skin surfaces, such as a face, and perform skin care is produced commercially.

[0003]On the other hand, when a suitable direct current for the skin is sent, galvanic electricity decomposition decomposes the moisture and salinity of a skin surface, an alkali solution is generated, the skin is stimulated and there are effects, such as opening pore. When the suitable high-frequency ac current for the skin is sent, radio-frequency energy vibrates the molecule of the water of skin structure by thermostat RISHISU, heat is generated, the circulation of a skin surface is urged and there is an effect of activating an organization. When the suitable pulse current for the skin is sent, hypodermic muscles are made to exercise, circulation of blood is urged, and there are effects, such as massaging and unfolding the skin.

[0004]Then, this invention is made for the purpose of enhancing the beautiful skin effect of an ultrasonic cosmetics probe further by using together the electric stimulus by a direct current, or high-frequency ac current or pulse current in addition to the physical irritation by the supersonic vibration of the conventional ultrasonic cosmetics probe.

[0005]

**[Means for Solving the Problem]**

In order to attain this purpose, this invention was constituted as follows.

[0006]Namely, in a probe which an invention of claim 1 contacts a vibration body driven ultrasonically to a skin side, and performs a cosmetics treatment, Said conductive vibration body and a grip electrode attached to a grasping part of said probe, It is an ultrasonic cosmetics probe having an energizing means which sends arbitrary current between said vibration body and a grip electrode, using together physical irritation by supersonic vibration, and an electric stimulus by energization, and performing a cosmetics treatment. An invention of claim 2 is the ultrasonic cosmetics probe according to claim 1 which considers said arbitrary current as a direct current. An invention of claim 3 is the ultrasonic cosmetics probe according to claim 1 which makes said arbitrary current high-frequency ac. An invention of claim 4 is the ultrasonic cosmetics probe according to claim 1 which makes said arbitrary current pulse current.

[0007]

**[Embodiment of the Invention]**

With reference to drawings, an embodiment of the invention is described below.

[0008]The lineblock diagram of the ultrasonic beauty device which carried out this invention is shown in drawing 1. An ultrasonic beauty device connects the ultrasonic cosmetics probe 1 to the control box 3 via the cable 2.

[0009]The control box 3 contains the control circuit 4, forms the touch-type navigational panel 5 in a transverse plane, and connects AC adapter 7 to the back via the power cord 6.

[0010]The navigational panel 5 operates setting out of a timer, output power, a change of an output frequency by parts, such as turning on and off, a face, a body, etc. of a power supply, etc.

[0011]The sectional view of the ultrasonic cosmetics probe which carried out this invention is shown in drawing 2. The ultrasonic cosmetics probe 1 attaches the vibration body 12 of the conical shape of a section trapezoid which has a flat apical surface at the tip of the tubed insulating case 11, and twists the grip electrode 13 around the gripping position of case 11 center section.

[0012]The vibration body 12 fits in and attaches the crevice a of the ring shape provided in the base, and the heights b of the ring shape established at the tip of the case 11. The case 11 is formed with a flexible spring material, operates the heights b at a tip as a cushion, insulates the vibration body 12 from the case 11, and is kept from restraining vibration of the vibration body 12. It prevents the oil produced from the cream which sealed the inside of the case 11 and was applied to the skin, or sweat, a steam, etc. invading in the case 11.

[0013]Inside the apical surface of the vibration body 12, the ultrasonic vibrator 14 constituted from electrostrictive ceramics is adhered, and the lead L1 and L2 are connected with the terminal T1 of the ultrasonic vibrator 14, and T2, respectively. The lead L3 and L4 are connected with the terminal T4 which penetrates terminal T3 and case 11 center section attached inside the vibration body 12, and flows in the grip electrode 13, respectively. These leads L1, L2, L3, and L4 are connected to the control circuit 4 which converges on the cable 2 which connects the control box 3 with the ultrasonic cosmetics probe 1, and is installed inside the control box 3.

[0014]The vibration body 12 is pliant, is formed with metal, such as an elastic thin stainless steel plate or hard aluminum, duralumin, and a thin copper plate, and performs surface treatments, such as hard chrome plating.

[0015]The grip electrode 13 pastes up an aluminum stay on an insulating base, coats the surface of urethane resin with conductive carbon ink, or forms it with conductive rubber, silicon (what mixed metal powder in rubber or silicon), etc.

[0016]The lineblock diagram of the control circuit of the ultrasonic beauty device which carried out this invention is shown in drawing 3. The control circuit 4 consists of the ultrasonic wave oscillator 41 which supplies the driving power of the ultrasonic vibrator 14, DC power supply 42, the high-frequency oscillator 43, and the pulse generator 44. And the output of the ultrasonic wave oscillator 41 is connected to the ultrasonic vibrator 14, and the output of DC power supply 42, the high-frequency oscillator 43, and the pulse generator 44 is connected to the vibration body 12 and the grip electrode 13 via the switch 45, respectively.

[0017]The control circuit 4 builds in a timer and performs control of treatment time, output power, changes of an output frequency by a part, such as turning on and off, a face, a body, etc. of a power supply, etc. according to operation of the navigational panel 5.

[0018]The ultrasonic wave oscillator 41 connects the ultrasonic vibrator 14 to the series parallel resonant circuit of LCR, and generates a 20-60-kHz ultrasonic wave. DC power supply 42 generate a 0.3-0.7-mA direct current which performs galvanic electricity decomposition. The high-frequency oscillator 43 generates 1.0-1.9-MHz high-frequency ac current required for thermostat RISHISU. The pulse generator 44 generates pulse

current with a low frequency of 5-10 Hz, and a high frequency of 20-100 Hz.

[0019]The ultrasonic cosmetics probes which carried out this invention are the above composition, and when treating, they apply cream to the apical surface of a treatment part and the vibration body 12 first. Next, the power supply of the control box 3 is made one, and the oscillating voltage of the ultrasonic wave oscillator 41 is impressed to the ultrasonic vibrator 14. Thereby, the vibration body 12 causes and carries out supersonic vibration of the bending deformation. Simultaneously, the treatment time by parts, such as a face and a body, is set up, and output power, an output frequency, etc. are switched. [0020]Next, case 11 center section is grasped together with the grip electrode 13, and pressing the apical surface of the vibration body 12 lightly right-angled, and sticking it to a skin side, the ultrasonic cosmetics probe 1 is moved along a skin side so that a circle may be drawn slowly. This acts so that a supersonic vibration wave may strike a skin side, the oil of pore, dirt, the remainder of makeup, etc. are floated, old epidermis is exfoliated, and wastes, a horny layer or a pimple, a pimple, etc. are removed without safety and a pain.

[0021]It is spread broadly and vibration is given to a skin side, and a supersonic vibration wave stimulates the circulation of a skin surface, activates an organization, unfolds muscular stress, and removes silverfish, wrinkles, sagging, etc.

[0022]If the switch 45 of the control circuit 4 is switched and a direct current is simultaneously sent between the vibration body 12 and the grip electrode 13, the water and the salt of a skin surface are decomposed and it is generated by ion, and these ion will be recombined and will become alkali solutions, such as sodium hydroxide. And these alkali solutions stimulate the skin, open pore, sterilize a skin surface, and promote the cleaning action of a supersonic vibration wave.

[0023]If the switch 45 is switched and high-frequency ac current is sent between the vibration body 12 and the grip electrode 13, radio-frequency energy will vibrate the molecule of the water of skin structure, and heat will be generated. The circulation of a skin surface is urged with this heat, an organization is activated, muscular stress is unfolded, and the massaging effect of a supersonic vibration wave is promoted.

[0024]If the switch 45 is switched and pulse current is sent between the vibration body 12 and the grip electrode 13, the massaging effect of a supersonic vibration wave will be promoted by toning or DORENAJU. Toning stimulates the depths of the skin by a pulse with a low frequency of 5-10 Hz, it makes muscles exercise, and circulation of blood is urged to it, and it massages and unfolds the skin. DORENAJU stimulates the front part of the skin by a pulse with a high frequency of 20-100 Hz, makes the upper levels' muscles exercise, promotes the flow of lymph, and removes an edema etc.

[0025]

#### **[Effect of the Invention]**

As explained above, the ultrasonic cosmetics probe of this invention sends a direct current, and high-frequency ac current or pulse current between a vibration body and the grip electrode attached to the grasping part of a probe, uses together the physical irritation by supersonic vibration, and the electric stimulus by energization, and performs a cosmetics treatment. Therefore, the galvanic electricity disintegration [ according to this invention ] by a direct current, The exothermic effect by thermostat RISHISU, the massaging effect by pulse current, etc. compound with the conventional cleaning action and massaging effect by supersonic vibration, and disassemble dirt and the fat of a pore

depths part further, Circulation of blood and lymph is promoted and a synergistic effect, such as improving the metabolism of the cell of the skin front part and a depths part, is brought about by promotion of an enzyme reaction, a heat effect, vasodilatation, etc. Thereby, especially, effect is demonstrated for recovery of silverfish, wrinkles, sagging, a pimple, etc., and dissolution, and there are uses, such as partial lean figure, quenching, a germicidal action.

**[Brief Description of the Drawings]**

[Drawing 1]It is a lineblock diagram of the ultrasonic beauty device which carried out this invention.

[Drawing 2]It is a sectional view of the ultrasonic cosmetics probe which carried out this invention.

[Drawing 3]It is a lineblock diagram of the control circuit of the ultrasonic beauty device which carried out this invention.

**[Description of Notations]**

1 Ultrasonic cosmetics probe

11 Case

12 Vibration body

13 Grip electrode

14 Ultrasonic vibrator

2 Cable

3 Control box

4 Control circuit

5 Navigational panel

6 Power cord

7 AC adapter

L Lead

T Terminal

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## CLAIMS

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**[Claim(s)]**

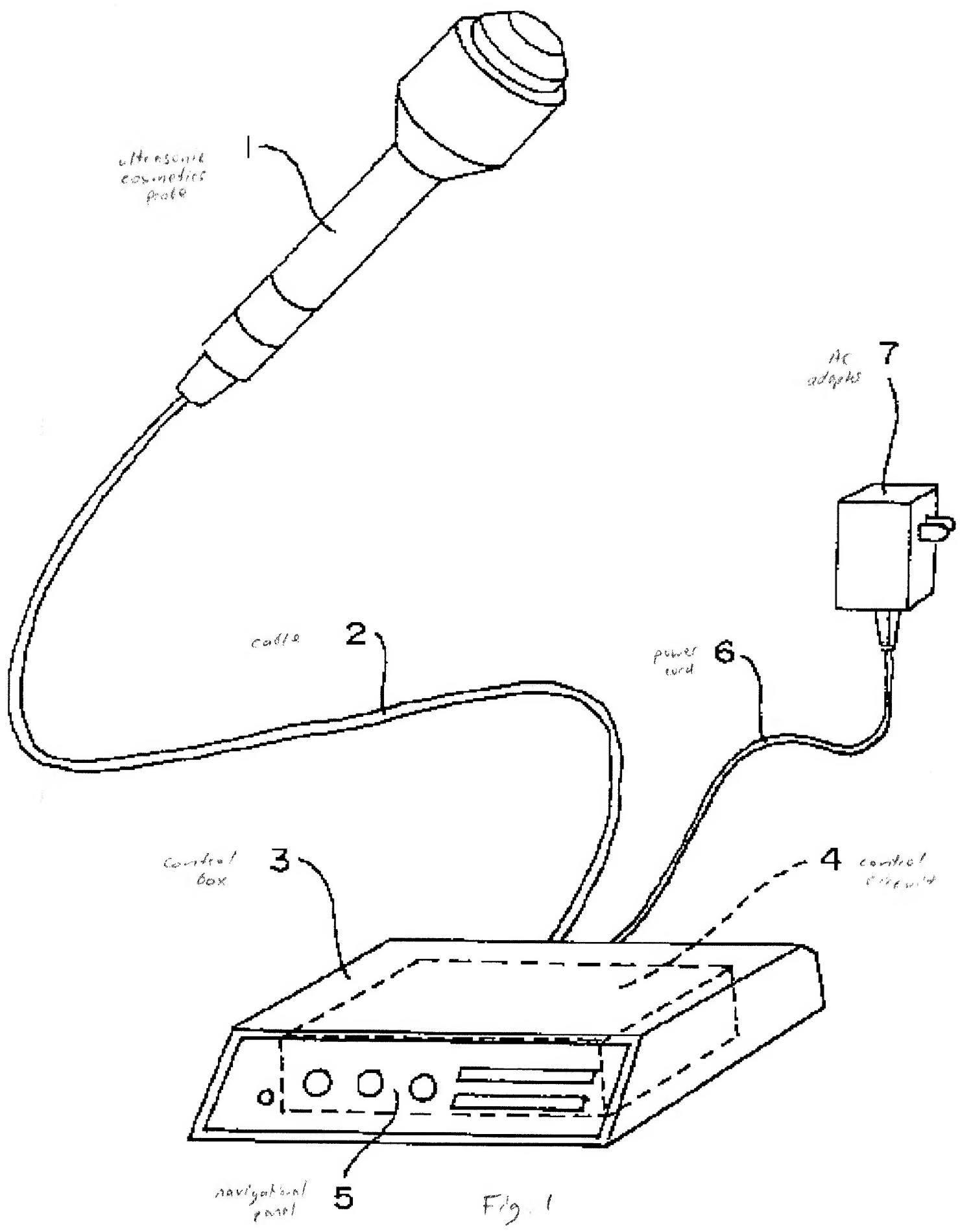
[Claim 1]In a probe which contacts a vibration body driven ultrasonically to a skin side, and performs a cosmetics treatment, Said conductive vibration body and a grip electrode attached to a grasping part of said probe, An ultrasonic cosmetics probe having an energizing means which sends arbitrary current between said vibration body and a grip electrode, using together physical irritation by supersonic vibration, and an electric stimulus by energization, and performing a cosmetics treatment.

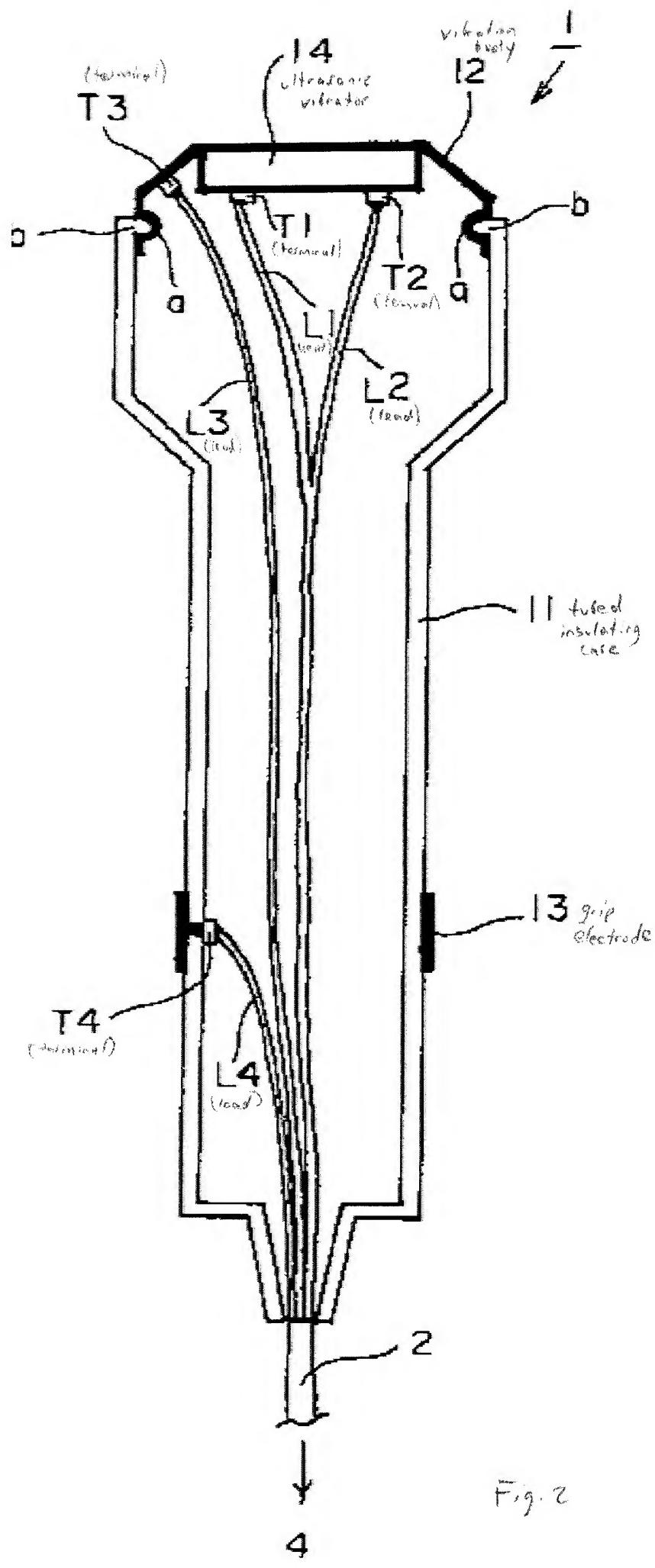
[Claim 2]The ultrasonic cosmetics probe according to claim 1 which considers said arbitrary current as a direct current.

[Claim 3]The ultrasonic cosmetics probe according to claim 1 which makes said arbitrary current high-frequency ac.

[Claim 4]The ultrasonic cosmetics probe according to claim 1 which makes said arbitrary current pulse current.

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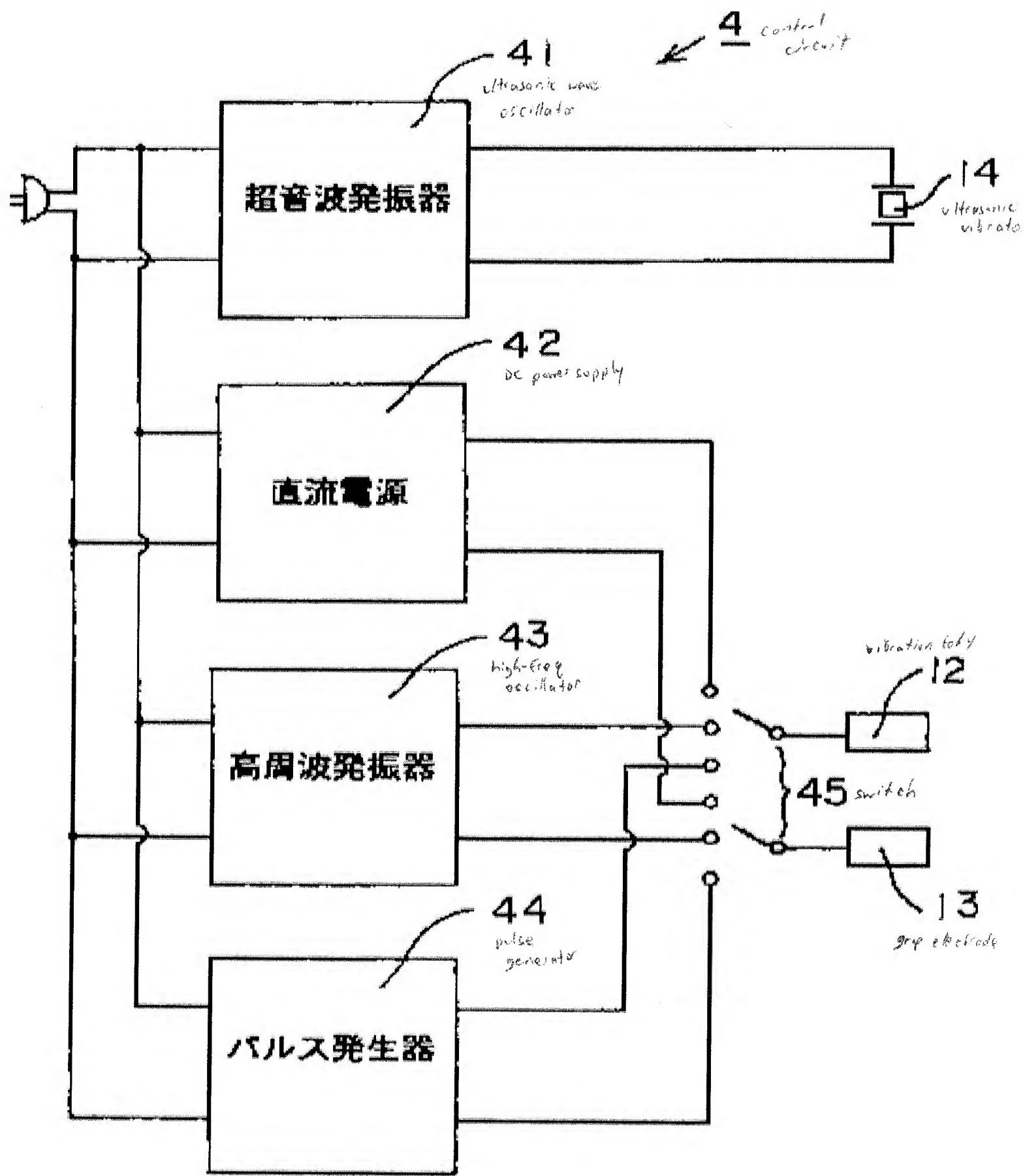


Fig. 3